

SAFETY UPDATE



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Hydrostatic Relief Valve Requirements.

In the past 11 months 37% of the inspections I have performed were cited for not having the required hydrostatic relief valves (HRV) installed. I want to take this opportunity to explain what HRV's are, why they are important and where they are required to be installed.

What Are They?

HRV's are spring loaded relief devices that are designed to be installed in any space where liquid propane may become trapped. They are similar to vapor relief valves except they are designed to relieve liquid. The majority of HRV's are designed to be installed in a 1/4" FNPT opening which is somewhat smaller than most vapor relief valves which generally range from 3/4" MNPT to 2" MNPT. They also have a higher "set to discharge" pressure, 400 psig is common for HRV's compared to the 250 psig that most vapor relief valves are set at.

NFPA 58 (2001) 2.4.7 Hydrostatic Relief Valves. *Hydrostatic relief valves designed to relieve the hydrostatic pressure that might develop in sections of liquid piping*

between closed shutoff valves shall have pressure settings not less than 400 psig (2.8 MPag) or more than 500 psig (3.5 MPag) unless installed in systems designed to operate above 350 psig (2.4 MPag). Hydrostatic relief valves for use in systems designed to operate above 350 psig (2.4 MPag) shall have settings not less than 110 percent or more than 125 percent of the system design pressure.

Why Are They important?

There are two important laws of physics that require the use of HRV's.

- 1) Liquid propane expands when heat is added to it.
- 2) Liquid propane will not compress.

If you add heat to liquid propane it will expand, if it is contained in an enclosed space the expanding liquid is trapped so the pressure will increase. If the pressure is allowed to rise past the containers burst pressure, it will fail and a Boiling Liquid Expanding Vapor Explosion (BLEVE) will occur. As the name implies a BLEVE is the rapid expansion of a boiling liquid into a vapor. Remember, liquid propane expands 270 times into vapor..... So a small amount of liquid will become a large amount of vapor when released into the atmosphere..... A properly installed HRV will open and relieve the excess pressure trapped in the container before it reaches a dangerous level.

Where Are They Required?

NFPA 58 (2001) 3.2.21 Hydrostatic Relief Valve Installation. *A hydrostatic relief valve that complies with 2.4.7 or a device providing pressure-relieving protection shall be installed in each section of piping (including hose) in which*

liquid LP-Gas can be isolated between shutoff valves so as to relieve the pressure that could develop from the trapped liquid to a safe atmosphere or product-retaining section.

NFPA 58 3.2.21 states “isolated between shutoff valves” In reality HRV’s must be installed anywhere liquid propane can be isolated. A pump bypass valve only allows liquid flow in one direction, if there is a shutoff valve installed downstream of it a HRV is required to be installed between the two. The same applies to backflow check valves and most emergency shutoff valves.

The number one excuse I hear for not installing the required HRV’s is “that valve is never closed” The fact that during normal operation certain valves are never closed is not a valid reason..... if the valve has the ability to be closed and isolate propane liquid, a HRV is required.

It is important to remember that if a propane installation is involved in a fire a large amount of heat will be introduced into the piping and container system. Firefighters know that the only way to safely extinguish a propane fire is to shutoff the gas supply..... how do you shutoff the supply of gas?..... by closing valves. If an unsuspecting firefighter closes a valve that causes liquid to be trapped in a section of piping without HRV protection, that section of piping could BLEVE injuring or killing the firefighter.

Take the time to look at all of your LP-Gas systems and verify that the required HRV’s are installed. You may be saving someone’s life.